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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Second Semester, B.E. - Semester End Examination; July / Aug. - 2022
Elements of Mechanical Engineering
(Common to all Branches)

Time: 3 hrs | Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Explain the formation of steam and working principle of steam and gas turbines.

CO2: Classify and Explain the working principles of different types of IC engines and calculate some of their performance parameters.

CO3: Classify different types of lathes and drilling machines and explain their working principles and different operations performed by them.

CO4: Classify different types of Milling and Grinding machines and explain their working principles and different operations performed by them.

CO5: Explain the working principles of different joining processes like welding, brazing and soldering. Identify different types of belt drives.

<u>*Note:*</u> *I) PART - A is compulsory. **Two** marks for each question.*

*II) PART - B: Answer any <u>**Two**</u> sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks
	I : PART - A	**10**
I a.	Define the following: i) Subcooled liquid ii) Enthalpy	2
b.	Define the following: i) Compression ratio ii) Thermal efficiency	2
c.	Define the terms; i) Ton of refrigeration and ii) Joule-Thomson effect.	2
d.	Write the difference between; i) Three Jaw and four jaw chuck ii) Drilling and boring	2
e.	i) Primary application of oxidizing flame is _____ ii) Filler material in the case of arc welding is made of _____	2
	II : PART - B	**90**
	UNIT - I	**18**
1 a.	Give the classification of boilers and their application.	9
b.	With a neat diagram, explain the pressure- temperature relationship in water.	9
c.	Explain the principle of raction turbine. With a neat sketch, explain the construction and working of Parson's turbine	9
	UNIT - II	**18**
2 a.	Give a detailed classification of IC Engines.	9
b.	Explain the performance parameters of IC engines	9
c.	With sketches and P-V diagram explain the working of a four stroke diesel engine.	9

UNIT - III
18

3 a. Differentiate between positive displacement pump and roto dynamic pump. Explain with a neat diagram, working principle of a positive displacement pump. — 9

b. Explain the working principle, advantages and disadvantages of centrifugal pumps. — 9

c. Explain with a neat sketch the principle of vapour compression refrigeration. — 9

UNIT - IV
18

4 a. With a neat sketches, explain the following lathe operations:

   i) Cylindrical turning

   ii) Facing

   iii) Taper turning — 9

b. With a neat sketch, explain the twist drill nomenclature. — 9

c. Explain; i) Up milling   (ii) Down milling   (iii) Cylindrical grinding — 9

UNIT - V
18

5 a. Explain the principles of welding, brazing and soldering with applications. — 9

b. Explain the different Oxy-acetylene gas flames with sketches. — 9

c. Derive an expression for length of an open belt drive. — 9

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